does not teach or suggest an additive which is selected from the group consisting of fatty amines, fatty amides, quaternary salts, amphoteric salts, resinous amines, resinous amides, fatty acids, resinous acids, ethoxylated versions of any of the foregoing and mixtures of any of the foregoing. The Examiner then turns to the Wakita reference to provide a suggestion for the foregoing additives.

The applicant believes that the foregoing rejection is not supportable for at least the following reasons:

1. Wakita does not disclose, support or suggest the use of the foregoing additives in a plating bath as required by claim 1-8 and 17-20.

Claim 1-8 and 17-20 require the addition to and use of the foregoing additives in an aqueous immersion silver plating solution. The additives have been found to improve the long-term solderability of the silver plate produced by the plating bath by reducing the tendency and probability of the silver plate to electromigrate into the solder over time and therefore degrade the electronic solder connection. (See specification at page 8 line 14-19).

In contrast, Wakita concerns a non-aqueous resinous conductive paint which comprises various paint resins and silver plated copper powder particles (See Wakita at Col. 1, lines 34-45). Fatty acids such as palmitic acid and stearic acid are added as dispersants to more effectively disperse the silver plated copper powder particles in the paint. (See Wakita at Col. 2, lines 13-26). Wakita notes that if the dispersion of the powder particles within the paint is not good, then the solderability of the paint will suffer. (See Wakita at Col 2, lines 25-26). This is merely a realization that in the Wakita conductive paint, the solder bonds to the metallic powder particles. Thus if the dispersion of the particles within the paint is not uniform, then certain areas of the paint will contain low levels of powder particles or no particles at all. In this case, since the solder adheres to the metallic powder particles, the solder will not properly adhere to portions of the paint with a low particle content. Thus a uniform dispersion of the particles within the paint is important. As noted, Wakita uses saturated fatty acids as dispersants for the powder particles.

Compare the foregoing to Claims 1-8 and 17-20 which utilize the noted additives in aqueous immersion silver plating solutions in order to retard the electromigration of the subsequent silver plate into the solder joint. Particularly note that the claimed silver baths are aqueous solutions. There is no need for dispersants in them since there is nothing to disperse. Thus the suggestion in Wakita that saturated fatty acids can act as dispersants in a resinous conductive paint for particulate matter therein is absolutely irrelevant to the invention at issue. Thus any combination of Wakita with Ferrier, et al. would not lead to the claimed invention.

2. There is no suggestion in either Ferrier, et al. or Wakita that would lead an artisan skilled in the art of this invention to combine the Ferrier and Wakita references in the manner suggested by the Examiner.

As noted, the invention herein is a patentable improvement upon the Ferrier, et al. disclosure. The Examiner has implicitly admitted it to be novel and then sought to combine Ferrier, et al. with a selected portion of Wakita. Such a combination is inappropriate since it would not be obvious to the relevant skilled artisan.

The inventors here have discovered that the addition of certain additives (specifically set out in the claims) to an aqueous immersion silver plating bath retards the process of electromigration which could occur later when the silver plated surface is soldered. Electromigration involves the migration of silver into a connected solder joint over time and under potential. Migration of silver into the solder joint degrades the physical integrity of the connection. Thus, the problem is something to avoid, and the inventors here have found a solution through the addition of specified additives to the silver plating solution.

In order to combine references in an obviousness rejection they must be from the same art or from a different art but addressing the problem to be addressed by the inventor. Put another way, it must be obvious for the skilled artisan to combine the references at the time of the invention. In this case, Wakita is neither from the same art nor is it relevant to the task at hand. Wakita concerns a conductive paint which uses fatty acids as dispersants for particulate matter within the paint. There is no mention of silver

plating solutions or of the electromigration problem, nor is there any suggestion as to how to solve the electromigration problem. Thus it would clearly not be obvious for the person skilled in the art of plating to be aware of and to pick out a teaching in a reference concerning conductive paints and dispersants used therein to solve a problem of electromigration through additives to a plating solution which is a true solution and has nothing to disperse.

Claim 17-20 have been amended to more clearly specify the silver plating solution involved.

CONCLUSION

There is no suggestion in either Ferrier, et al. or Wakita that would lead an artisan skilled in the art of plating to combine the Ferrier and Wakita references in the manner suggested by the Examiner. In addition, a combination of the references would not yield the improved plating solution and process of this invention. The inventors here sought and discovered plating solution additives which reduce the tendency for the plated immersion silver deposit to electromigrate. The Wakita reference provides absolutely nothing to the understanding of this invention. For all of the foregoing reasons, and based upon an interview with the Examiner on October 24, 2000, the applicant believes that his application is in a condition for immediate allowance and such action is earnestly sought.

Respectfully Submitted,

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